

**REMARKS**

The foregoing amendments and these remarks are in response to the Office Action dated June 14, 2007 (hereinafter "Office Action").

At the time of the Office Action, claims 1-20 were pending. Claims 1-20 are rejected.

By this Amendment, claim 2 is amended to include the concentrations recited in claim 19 and claims 17, 18, and 19 are cancelled. No new matter is added.

Review and reconsideration are requested in view of the following remarks.

**Double Patenting**

Claims 1-20 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 7,223,420. Applicants submit a properly executed terminal disclaimer to overcome this rejection.

Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/689,219. Applicants submit a properly executed terminal disclaimer to overcome this rejection.

**Claims Rejections – 35 USC § 103**

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO91/07357 issued to Berger *et al.* (hereinafter "Berger").

The position of the Examiner can be found on pages 4-5 of the Office Action. Applicants note that the Office Action refers exclusively to the English language abstract of the German-language Berger disclosure and claim 8 (although the Office Action refers to claim 7, it appears claim 8 was intended). The Examiner states that:

[Berger] sets out the same raw materials as claimed herein. Berger forms a crystalline and amorphous phase. Processing of the material appears to utilize heat melting of the materials. It is therefore the position of this examiner, that those of ordinary skill would have expected not only the same composition characteristics from the work up of these materials as taught by Berger et al, but

also the same bone replacement effects.  
Office Action page 4-5.

Applicants respectfully traverse in light of the attached English translation of the relevant portions of Berger and in view of the claims, as amended.

In order to render the claimed invention obvious, the reference must disclose or suggest both the desirability of the claimed composition and a method of creating the claimed composition. Applicants are well acquainted with WO 91/07357, as it concerns another invention by inventor Berger. Based on the following discussion, it should become clear that Berger simply does not meet this standard, because Berger does not disclose or suggest either the necessary starting materials or the thermal treatment required to form the resulting crystal phases and inorganic compounds of the claimed invention.

It is well known in the art that the type of *crystalline phases and amorphous phases* and the relative amounts of each are directly linked to the starting materials and the melting and cooling process to which the starting materials are exposed. A factor of significant importance to the resulting crystalline and amorphous phases is the particular tempering steps to which the starting material is exposed.

Similarly, it is well known that the *specific inorganic compounds* formed during a heating and cooling process are directly linked to the hold points and maximum temperature reached during the thermal process. Instant claim 2 is a product-by-process claim reciting specific conditions and starting materials for preparing the claimed powder mixture, which recites both specific inorganic compounds and specific crystalline and amorphous phases. ***These conditions and starting materials are the only method known to the Applicants to produce the mixture of crystalline and amorphous phases with the claimed mixture of orthophosphates, diphosphates, and, as in claim 3, chain phosphates:***

In order to clarify the content of Berger, Mr. Wolf-Jürgen Walter, the German Patent Attorney who prosecuted Berger, has provided a sworn translation of relevant portions of Berger, claim 8 and page 14, lines 1-11, *see* Attached Translation and oath dated July 12, 2007.

Referring to the translation, claim 8 of Berger is drawn to a vitreous or vitreous-  
(WP415929;1)

crystalline material manufactured by melting together a powder mixture of 20-55%-wt CaO, 5-25% Na<sub>2</sub>O, 0-15% K<sub>2</sub>O, 0-15% MgO, 30-50% P<sub>2</sub>O<sub>5</sub>, 0-15% SiO<sub>2</sub>, 0-40% Na<sub>2</sub>SO<sub>4</sub> and/or K<sub>2</sub> SO<sub>4</sub>. This mixture is melted together by heating the materials to 1200-1580°C for a period of at least 10 minutes. The Berger materials then undergo spontaneous cooling or temperature-controlled cooling. Finally, the Berger materials may be treated with a tempering step at 600-1200°C during the cooling. The product prepared is completely different from the instant product with respect to the crystal phases.

The clearly distinguishable crystal compositions in Berger and the present invention result because of their divergent thermal history. This divergent thermal history is clearly set forth for ease of comparison in rows 2 and 3 of Comparison Table 1, below, and the following summary:

- The claimed invention includes three holds (350-450°C, 750-850°C and 950-1,050°C) during the heating process, Berger discloses none.
- The claimed invention has a maximum heating temperature of 1550-1650°C, whereas Berger's maximum heating temperature is 1200-1580°C.
- The claimed invention provides for spontaneous cooling or temperature-controlled cooling without any holding step, whereas Berger includes a holding step in the range of 600-1200°C.

Clearly, Berger does not disclose or suggest the thermal treatment required to form the claimed invention. Because of these divergent thermal treatments, the Berger materials and the material of the claimed invention contain different amounts of crystalline and amorphous phases and crystals with distinct inorganic compounds.

**Comparison Table 1 – Comparing the process used in Berger (WO 91/07357) to that of instant claim 2.**

<b>Process</b>	
<b>U.S. Serial No. 10/689,217</b>	<b>Berger (WO 91/07357)</b>
1. Melting together a powder mixture of CaO 34-48% P <sub>2</sub> O <sub>5</sub> 44-54% Na <sub>2</sub> O 1.5-10.5%	1. Melting together a powder mixture of CaO 20-55% P <sub>2</sub> O <sub>5</sub> 30-50% Na <sub>2</sub> O 5-25%

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K <sub>2</sub> O 1-11% MgO 1.5-3% SiO <sub>2</sub> 0.1-4%	K <sub>2</sub> O 0-15% MgO 0-15% SiO <sub>2</sub> 0-15%
2. Step-by-step heating with holds for tempering at: a) 350-450°C b) 750-850°C c) 950-1050°C	2. No tempering holds at heating
3. Melting temperature 1550-1650°C	3. Melting temperature 1200-1580°C
4. Spontaneous cooling or temperature-controlled cooling	4. Spontaneous cooling or temperature-controlled cooling
5. No holding steps during cooling	5. Optional holding step at 600-1200°C during the cooling
6. <b>PRODUCT:</b> A powder mixture of crystal phases Ca <sub>10</sub> Na(PO <sub>4</sub> ) <sub>7</sub> , Ca <sub>10</sub> K(PO <sub>4</sub> ) <sub>7</sub> , Ca <sub>10</sub> K <sub>x</sub> Na <sub>1-x</sub> (PO <sub>4</sub> ) <sub>7</sub> , Na <sub>2</sub> CaP <sub>2</sub> O <sub>7</sub> , K <sub>2</sub> CaP <sub>2</sub> O <sub>7</sub> , Ca <sub>2</sub> P <sub>2</sub> O <sub>7</sub> and X-ray amorphous (non-crystal) phases.	6. <b>PRODUCT:</b> A glassy or glassy-crystal body with the following phases: rhenanite = CaNaPO <sub>4</sub> phase X = Ca <sub>2</sub> KNa(PO <sub>4</sub> ) <sub>2</sub> phase A = Ca <sub>5</sub> Na <sub>2</sub> (PO <sub>4</sub> ) <sub>4</sub> glaserite = K <sub>3</sub> Na(SO <sub>4</sub> ) <sub>2</sub> crystalline potassium sulfate = K <sub>2</sub> SO <sub>4</sub> and their mixed crystals.
7. Solubility 60-250 µg/mg (claim 13)	7. Solubility 1-15 mg/g

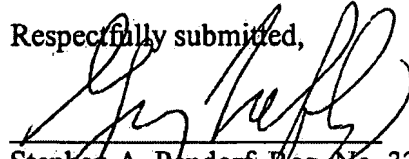
For at least the above reasons Applicants believe independent claims 1 and 2 are drawn to allowable subject matter. Dependent claims 3-16 and 20 are also believed to be allowable based on the subject matter claimed therein and their dependence on the independent claims

The Commissioner is hereby authorized to charge the \$260.00 fee for two terminal disclaimers to Deposit Account No. 50-0951. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 50-0951.

U.S. Application No.: 10/689,217  
AMENDMENT A

Attorney Docket: 3975.023

Respectfully submitted,



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